

WHAT IS CLAIMED IS:

1. An encoder comprising:

5 a drum comprising a cylindrical surface characterized by an axis, said drum having a surface with a normal perpendicular to said axis;

a first track comprising a plurality of alternating reflective and non-reflective stripes arranged on said cylindrical surface;

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a first light source for illuminating said stripes at an opaque angle relative to said normal; and

15 a first photodetector positioned to receive light from said light source that is reflected from said reflective stripes when said drum moves relative to said photodetector, said reflective stripes forming an image of said light source on said first photodetector.

2. The encoder of Claim 1 wherein said light source emits a collimated beam of light;

20 3. The encoder of Claim 1 wherein said drum rotates about said axis when a shaft is rotated.

4. The encoder of Claim 3 wherein said shaft is coincident with said axis.

25 5. The encoder of Claim 1 wherein said cylindrical surface lies between said track and said axis.

6. The encoder of Claim 1 wherein said track lies between said cylindrical surface and said axis.

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7. The encoder of Claim 1 further comprising:

a second track comprising a plurality of alternating reflective and non-reflective stripes arranged on said cylindrical surface;

5 a second light source for illuminating said stripes at an opaque angle relative to said normal; and

a second photodetector positioned to receive light from said light source that is reflected from said reflective stripes, wherein said drum moves relative to said photodetector.

10 8. The encoder of Claim 7, wherein said reflective stripes of said second track have widths that are different from said reflective stripes of said first track.